

# **EXHIBIT A**

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## CURRICULUM VITAE

**DATE PREPARED:** July 21, 2005

### **PART I: General Information**

**Name:** Nathaniel Merriman Sims

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Milton, MA 02186 United States

**Office Address:** Department of Anesthesia  
55 Fruit Street, Massachusetts General Hospital  
c/o Biomedical Engineering CLN 237  
Boston, MA 02114 United States

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**Place of Birth:** Burlington, Vermont

### **Education:**

1975	B.A., Harvard College
1979	M.D., Columbia U. Col. Of Physicians And Surgeons

### **Postdoctoral Training:**

1979-1980	Intern in Surgery, Massachusetts General Hospital
1980-1981	Resident in Surgery, Massachusetts General Hospital
1981	Resident in Orthopaedics, Harvard Combined Orthopaedic Residency Program
1982-1985	Resident in Anaesthesia, Massachusetts General Hospital
1984-1985	Fellow in Cardiac Anesthesia, Massachusetts General Hospital

### **Licensure and Certification:**

1981	Diplomate, National Board of Medical Examiners
1981	Massachusetts Registered Physician
1987	Diplomate, American Board of Anesthesiology

### **Academic Appointments:**

1979-1981	Clinical Fellow in Surgery, Surgery-Massachusetts General Hospital, Boston, MA
1981	Clinical Fellow in Orthopedic Surgery, Orthopedic Surgery-BWH,

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Boston, MA  
1982-1985 Clinical Fellow in Anaesthesia, Anaesthesia-Massachusetts General Hospital, Boston, MA  
1985-2000 Instructor in Anaesthesia, Anaesthesia-Massachusetts General Hospital, Boston, MA  
1999-2005 Assistant Professor of Anaesthesia, Anaesthesia-Massachusetts General Hospital, Boston, MA

**Hospital or Affiliated Institution Appointments:**

1984-1986 Assistant in Anesthesia, Associate Staff, Massachusetts Eye and Ear Infirmary, Boston, MA  
1985- Assistant in Anesthesia, Massachusetts General Hospital, Boston, MA

**Other Professional Positions and Major Visiting Appointments:**

1985 Clinical Fellow in Anesthesia, Royal Liverpool Children's Hospital, Liverpool, England  
1990 Visiting Anesthesiologist, Department of Anesthesia, University of Melbourne, Melbourne, Australia

**Hospital and Health Care Organization Clinical Service Responsibilities:**

1985-2001 Attending Physician, Cardiac Anesthesia, Massachusetts General Hospital

**Major Administrative Responsibilities:**

1988-1991 Associate Director (Special Projects), Cardiac Surgical ICU, Massachusetts General Hospital  
1990-1993 Co-Director, Flexible Monitoring Development Project, Massachusetts General Hospital  
1994- Physician Advisor, Department of Biomedical Engineering, Massachusetts General Hospital  
1996- Physician Advisor, Department of Biomedical Engineering, Partners  
2002- Focus Area Leader, Untethered Monitoring, CIMIT - Innovative Technology for Medicine

**Major Committee Assignments:**

1988- Bedside Technology Task Force, Member, Massachusetts General Hospital  
1988-1989 Design Team, Ellison 4 Surgical Intensive Care Unit, Member, Massachusetts General Hospital  
1988-1993 Clinical Practices and Safety Committee, Department of Anaesthesia/CC, Member, Massachusetts General Hospital

1992- SC 62D/MT 23: Infusion Pumps. (Safety Standard), Member, International Electrotechnical Commission

1992-1993 Cardiac Access Evaluation Committee, Member, Massachusetts General Hospital

1992-1993 Cardiac Access Operations Committee, Member, Massachusetts General Hospital

1993- Infusion Device Committee (AAMI/ID), Member, Association for the Advancement of Medical Instrumentation

1997-1998 Design Team, Blake 8 Surgical Intensive Care Unit, Member, Massachusetts General Hospital

2000-2002 Design Team, Operating Room of the Future, Member, Massachusetts General Hospital and CIMIT

2001-2004 Global Advisory Board, Information Technology, Member, GE Healthcare

2002- Wireless Task Force, Member, Partners

2002- Infusion Device Committee (AAMI/ID), Co-Chair, Association for the Advancement of Medical Instrumentation

2003- ED 2005 (Emergency Department 2005) Steering Committee, Member, Massachusetts General Hospital

2003-2005 Drug Library Development Team - Pediatric Medication Administration Process, Member, Massachusetts General Hospital

2003-2004 US Army - Advance Diagnosis and Triage Research Task Area IPT Core Team, Member, US Army (PEO, Soldier PM, Land Warrior, AMEDD Center and School)

2004- Signature Initiative, Patient Safety, Medication Administration, Smart Pumps, Member, Partners

2004- Steering Committee, Ambulatory Practice of the Future, Member, Massachusetts General Hospital and CIMIT

2004- Signature Initiative; Patient Safety; Medication Safety; Positive ID, Co-Chair, Partners

2004- CTAIPP - Council on Technology Adoption and Innovative Practice Promotion, Member, Massachusetts General Hospital

2004- Steering Committee, Vision for Physiologic Monitoring, Member, Massachusetts General Hospital

**Professional Societies:**

1985-2001 American Society of Anesthesiologists, Member

1985-2001 Massachusetts Society of Anesthesiologists, Member

1991-1996 American Board of Anesthesiology, Associate Examiner

1992- Association for the Advancement of Medical Instrumentation, Member Board of Directors, 2004-

1993-2005 Society for Technology in Anesthesia, Member

**Community Service Related to Professional Work:**

- 2004- AFNE Pilot, Angel Flight NorthEast
- 2004- Member, Board of Trustees, Daniel Webster College, Nashua, New Hampshire
- 2004-2005 Presidential Search Committee, Daniel Webster College, Nashua, New Hampshire

#### **Awards and Honors:**

- 1969 John Harvard Scholarship, Harvard College
- 1978 Alpha Omega Alpha, Columbia U. Col. Of Physicians And Surgeons
- 1979 New York Orthopaedic Hospital Award for Excellence in Orthopaedics, Columbia U., Barnard Col.
- 1979 Dr. Alfred P. Steiner Award for Excellence in Research, Columbia U. Col. Of Physicians And Surgeons
- 1979 Dr. Harold Lamport Biomedical Research Prize for Best Thesis Reporting Original Biomedical Research, Columbia U. Col. Of Physicians And Surgeons
- 1983 Mirosława T. Jasinska, M.D. Pediatric Anesthesia Award, Massachusetts General Hospital
- 1985 MGH Dalton Scholar (supporting Clinical Fellowships - Cardiac Anesthesia - UK - 3 locations), Massachusetts General Hospital
- 1998 Partners In Excellence Award, Partners
- 1999 Partners in Excellence Award, Partners
- 2000 Partners in Excellence Award, Partners
- 2004 Distinction Design Award - MGH Operating Room of the Future, Symposium on Healthcare Design
- 2004 Partners in Excellence Award (Signature Initiative - Medication Safety), Partners

#### **Part II: Research, Teaching, and Clinical Contributions**

##### **A. Narrative report of Research, Teaching, and Clinical Contributions**

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**RESEARCH ACTIVITIES:** The focus of Dr. Sims's research activity is drug delivery devices and physiological monitoring systems for the care and support of critically-ill patients, particularly cardiac medical/surgical patients, and patients undergoing anesthesia. Dr. Sims's research and development have produced numerous innovations and patents and technology implementations. Two areas in particular have had broad impact on patient safety and care: so called "smart pumps" for improving the safety of drug delivery and "flexible monitoring" for creating more effective physiological monitoring systems for the care and support of critically-ill patients. He developed these after recognizing opportunities to improve patient safety and reduce preventable patient injuries. Dr. Sims was not only the inventor but organized the highly effective teams of physicians, nurses, pharmacists, engineers, technologists and scientists that led to the

development and widespread implementation of these devices throughout Partners and the world.

#### Flexible Monitoring

Dr. Sims conceived of the concept of "flexible monitoring" ( now often known as continuum of care monitoring) with his biomedical engineering colleague, James Welch. The idea of flexible monitoring was based on the observation that many ICU patients remained in units only because needed monitoring was unavailable on general care floors. To equip all floors with monitors would be prohibitively expensive. Thus Sims and Welch developed a system that allowed a monitor to be used at *any* bedside location throughout the hospital with physiologic information displayed at a central nursing workstation. After being awarded a patent and identifying an industrial partner via an open competition among all manufacturers of patient monitoring, Dr. Sims became the critical element in the development of a practical system and its implementation, initially at the MGH. This has dramatically altered patient care. Others then pursued the concepts introduced by Dr. Sims to the point that Flexible Monitoring is now a standard of care throughout the world. Dr. Sims has been instrumental in this expansion.

#### Smart Pumps:

Dr. Sims, recognizing the hazards associated with infusion technology, particularly how miscalculations and programming errors can lead to tragic results, determined to develop practical and effective technology solutions. He and two collaborating colleagues conceived of the concept of embedding a "library" of drug dosing into the pumps. The pump hardware and software allows institutions to configure unique care-specific profiles with pre-defined drug dose limits, and other delivery parameters, to meet the particular needs of multiple patient care areas and to ensure patient safety. This intelligent programming capacity, called "smart pumps", is now the standard for controlled infusion devices.

Developing the idea alone would not have been enough to make it practical and widely available. Once again, Dr. Sims led a demonstration project that drew the attention of the largest manufacturers and vendors of infusion pumps. Demand for the technology increased even more after the Institute of Medicine report emphasizing the >50,000 US patient deaths annually associated with medical errors and the publication of other studies indicating that the delivery of intravenous drugs accounts for approximately one-third of all the serious and life-threatening medication errors. The importance of Smart Pumps to medication safety has been recognized by both the Emergency Care Research Institute (ECRI) and the highly regarded Institute for Safe Medication Practices (ISMP). ECRI has made several statements about the importance of such protection in infusion devices and now will recommend only devices that have this feature.

#### Other Inventions

Dr. Sims has had a principle conception and design role in the MGH "Operating Room of the Future (ORF)". The ORF is a highly efficient, high-tech OR that uses parallel processes of patient care that allow for a rapid turnover time between cases, and an almost doubling of OR productivity, while maintaining patient safety. The ORF concept

is being currently studied and will likely be widely emulated in the US. Dr. Sims and his team have also developed a wearable monitoring technology called "untethered monitoring", that is expected to be widely employed in healthcare in the future.

The output of the Sims Lab, has been substantial. Dr. Sims's has been awarded approximately 40 patents (including 8 issued US patents, 1 provisional US patent application, 2 filed US utility patent applications, and numerous international patents) for innovative medical devices that have been reduced to practice and have entered worldwide clinical use. Substantial patent licensing revenue for support of the Sims Lab has been realized by Massachusetts General Hospital.

#### CLINICAL AND TEACHING ACTIVITIES:

Clinical Teaching: Dr. Sims's principal clinical and clinical teaching venue since 1981 has been the Cardiac Operating Rooms of the Massachusetts General Hospital. In each case, he has provided hands-on, one-on-one teaching to a Cardiac Anesthesia Fellow or advanced anesthesiology resident. The total number of patients for whom he has provided anesthetic management of major cardiac operations is greater than 1500.

#### Alternative Teaching Technologies

Dr. Sims has devoted a major effort to developing 'alternative teaching technologies' addressing the problem of preventable medical error. His particular interest is related to avoiding the hazards associated with mis-programming or mis-use of patient care devices, particularly physiological monitoring systems and electronic intravenous drug delivery devices. His focus has been the development of automated training and guidance systems for users of patient care devices. The automated, continuously available, context sensitive teaching systems he has incorporated into patient care devices afford the opportunity to improve the training of physicians and allied health professionals and to reduce preventable medical injury.

Automated teaching devices and systems pioneered by Dr. Sims include both

1 - Online Learning Systems for Medical Device End Users and

2 - Medical Devices with On-Board Guidance

In the first area (online learning systems) Dr. Sims and a colleague worked with GE Healthcare and a multidisciplinary team from Massachusetts General Hospital to develop a sophisticated online distance learning system for commonly-used physiological monitoring systems. The first instantiation of this application supports the GE Solar 8000 and Dash monitors, supplements current 'in-service training', is hosted by servers in Waukesha, WI, is browser accessible from any networked PC running Macromedia "Flash" applications and capable of delivering video/audio content, is supported by a Learning Management System, and is CEU accredited. The application was announced

May 31, 2001.

In the second area (patient care devices with onboard 'guidance') Dr. Sims's invention of "Infusion pumps with an electronically loadable drug library and a user interface for loading the library" has permitted thousands of hospitals to implement drug infusion pumps with a custom user interface exactly replicating the particular hospital's intravenous drug administration practices and guidelines for their use. The devices assist users in correct device programming in the first place, and in addition provide 'guardrails' that provide alerts and guidance is predefined, hospital-customized limits are exceeded.

Finally, Dr. Sims in his teaching and educational role has devoted particular attention to the special problem of standardized pediatric intravenous medications. Recent mandates, applicable to pediatrics, from the Joint Commission on Accreditation of Healthcare Organizations [JCAHO] and from the US Pharmacopeial Convention [USP 767] have highlighted this area. Dr. Sims has just completed a bedside guide for use in pediatric critical care and anesthetizing locations which will facilitate education of healthcare professionals in the safe transition to clinical practice changes that will both improve care and comply with the new mandates.

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#### **B. Funding Information**

1985-1987	Project Director, Foundation - National Health Research Foundation, Newton, MA, PN - 1985 - 12, Improved Heated Humidifiers for Patient Warming
1987-1988	Project Director, Company - Mon-A-Therm, St. Louis, MO, PN - 1987 - 14, Endotracheal Tube with Distal Airstream Temperature Sensor
1990-1992	Co-P.I., Company - Ohmeda, Inc, Madison, WI, PN - 1990 - 16, Anesthesia Breathing Circuit Improvements
1990-1993	Co-P.I., Company - Protocol Systems, Inc., Beaverton, OR, PN - 1990 - 17, Flexible Physiological Monitoring Systems Development and Clinical Assessment
1991-1994	Project Director, Company - Baxter Healthcare Corporation, Deerfield, IL, PN - 1992 - 14, Smart Drug Infusion Pump Engineering Development
1994-1998	Project Director, Funding: Sims Lab Royalty Revenue, PN - 1994 - 24, Multi-Dose Syringe Driver Engineering Development
2000-2001	Co-P.I., Other - Sims Lab Royalty Revenue, PN - 2000 - 16, Web-Based End-User Training for Physiological Monitoring Systems
2001-2002	P.I., Other - CIMIT (Innovative Technology for Medicine), PN - 2001 - 34, Indoor Location Systems Engineering Development and Testing in MGH Operating Room of the Future
2001-2003	P.I., U.S. Army (Soldier Systems Center) Natick via CIMIT, PN - 2002 -

- 09, Wearable Networked Physiological Monitoring Sensor and Health State Assessment Systems
- 2002-2003 Co-P.I., Other - Partners Healthcare, PN - 2002 - 06, Wireless Medical Device - Coexistence Testing: 802.11 Frequency Hopping Physiological Monitors vs 802.11b Wireless Local Area Networks
- 2004- Project Director, Other - Sims Lab Royalties, PN - 2004 - 06, Smart Drug Infusion Pump-Compatible Pediatric Standardized Intravenous Drug Infusion System - Engineering Development and Preparation of User Guidance Manuals
- 2004- Project Director, Other - Sims Lab Royalties, PN - 2004 - 13, Automated Drug Identification for Smart Drug Infusion Pumps - Development of a Draft Standard for Data Content of Pump-Readable 2-Dimensional Bar Codes
- 2005- Project Director, Other - Sims Lab Royalties, PN - 2005 - 05, Single Dose Syringe Driver System for Intravenous Ceftriaxone Dosing in Amyotrophic Lateral Sclerosis

#### **D. Report of Teaching**

#### **2. Regional, national, or international contributions**

##### **a. Invited Presentations**

##### **Invited Lecture**

##### *National*

- 2001 Web-based training: Online learning systems for medical device end-users, General Electric Healthcare
- 2002 Combat Physiologic Life Line: physiologic monitoring in chaotic dangerous environments, US Army: ATACCC 2002 "Advanced Technology Applications for Combat Casualty Care"
- 2004 Untethered Monitoring: moving beyond the walls and boundaries of traditional hospital-based physiologic monitoring, AAMI - Annual Meeting - "Wireless Smart Sensors" Session
- 2004 Intelligent healthcare buildings for "High Velocity" procedural medicine, Harvard University Graduate School of Design - Cont Ed Course - Design of Surgical Environments

##### *Regional*

- 2000 "Plug and Play" in the operating room: connectivity of medical devices, CIMIT / MIT / Sloan School "Medical Innovations" Course
- 2000 Future Devices for the OR: foundation for increased productivity and

- patient safety - introducing the APRIL project, CIMIT Forum
- 2001 The "BodyLAN Project" - from the operating room to the home, University of Rochester - Conference on Remote Healthcare
- 2004 Smart bedside technology: R&D status update and research agenda, with particular reference to "smart drug pumps", Partners Healthcare Information Systems - Research Symposium
- 2004 Biomedical Engineering: how our world impacts, and is impacted by facility planning and construction, Partners Healthcare - Partners Real Estate
- 2004 Intelligent healthcare buildings for "High Velocity" procedural medicine, Harvard University Graduate School of Design
- 2004 Setting priorities in implementing "smart" bedside technology, Harvard Medical School and Alaris Medical Systems - Patient Safety Seminar
- 2005 Case Study - Smart Drug Infusion Pumps - "Dr. Nat Sims - Medical User-Innovator", MIT Sloan School of Management / "Managing Innovation:Emerging Trends"

#### **Plenary Presentation**

##### *National*

- 2003 Intelligent, efficient acute care medical buildings: new bricks and mortar? Smart, IT-enabled Clinical Workflow? Or Both?, Indoor Location Technology Leadership Conference
- 2004 Intelligent, efficient acute care medical buildings: architecture is critical to achieving perioperative productivity gains, Society for Technology in Anesthesia
- 2004 Intelligent healthcare buildings for "High Velocity" procedural medicine, CIMIT / MGH Plug N Play Conference

##### *Regional*

- 2001 Invention is Easy, Innovation is Difficult, Biotech Connecticut Conference, Hartford, CT
- 2004 Insights from breakthrough technological innovation: does innovative ambulatory clinical care require new bricks and mortar?, CIMIT and Massachusetts General Hospital Physicians Organization

#### **Seminar**

*National*

- 2002      Combat Physiologic Lifeline: monitoring for remote triage in distributed environments, US Army Institute for Surgical Research - Trauma Informatics Retreat
- 2003      IV infusion pumps: the missing component in bar code medication administration systems, Alaris Medical Systems Center for Medication Safety - Conference on Bar Code Med Administration
- 2004      Smart Bedside Technology: device/information technology convergence, with particular reference to "Smart Drug Pumps", GE Healthcare Information Technology Global Advisory Board

*Regional*

- 2000      "Blake Ballroom OR Design Options" - system technology objectives & industry collaboration - costly space needs low turnover time!, MGH / CIMIT Operating Room of the Future Steering Committee
- 2000      Blake O.R. Proposal to MGH Surgical Executive Committee, CIMIT
- 2001      Continuous implantable cardiorespiratory monitoring, CIMIT and Medtronic, Inc.
- 2001      Patient Centric Networking, CIMIT - Scientific Advisory Board
- 2001      Patient-centric network, CIMIT
- 2003      Clinical technology assessment and decisionmaking: new challenges for materials management - case studies [oximetry; smart pumps], VHA (Voluntary Hospitals Association) Northeast
- 2003      Drug infusion technology at Mass General Hospital: relationship to "Pediatric Medication Administration System" project, Massachusetts General Hospital CPM/CPI
- 2003      Biomed research: smart pumps, wireless real-time physiologic monitoring, wireless coexistence, indoor location systems, Partners Healthcare LS. - Research Symposium
- 2004      Smart Pumps: potential role in intravenous medication safety at Partners Healthcare, Partners Healthcare Chief Nurse Council
- 2004      Smart Pumps: role in "IV Medication Safety" (in relation to wireless, "eMAR", and point of care bar coding), Massachusetts General Hospital EMAP Steering Committee
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- 2004 Emerging opportunities in real-time workflow process improvement, Partners Healthcare / CIMTT / GE Healthcare Retreat
- 2004 Strategic Clinical Innovation and Processes of Care: one success and one failure from the Sims Lab, Massachusetts General Hospital / CIMTT - CTAIPP Retreat

#### **E. Report of Clinical Activities**

- 1982-2001 Anaesthesia, Cardiac Massachusetts General Hospital  
Clinical Activity Description: 1982-1985 Anesthesia Residency and Fellowship in Cardiac Anesthesia 1985-2001 Cardiac Anesthesia - approximately 1,500 major cases (10,000 hours) of clinical care in the Cardiac Operating Rooms of the Massachusetts General Hospital  
Patient Load: 0; n/a  
Clinical Contributions: Developed essentially all physiological monitoring system technology and intravenous drug infusion systems technology used on the Cardiac Surgical Service and in Massachusetts General Hospital's Critical Care and General Care environments from 1987-2005

#### **Part III: Bibliography**

##### **Original Articles**

1. Tyzbir RS, Kunin AS, Sims NM, Danforth E. Influence of diet composition on serum triiodothyronine (T3) concentration, hepatic mitochondrial metabolism and shuttle system activity in rats. *J Nutr.* 1981;111(2):252-9.
2. Sims NM, Kelley KL, Dayer JM, Krane SM. Calcitonin stimulates amino acid incorporation into plasminogen activator by cultured renal tubular cells. *FEBS Lett.* 1981;132(2):174-8.
3. D'Ambra MN, Lowenstein E, Philbin DM, Allyn J, Anderson M, Sims N, Koski G, Schneider R, Bird S. A postoperative assessment system for cardiac anesthesia services. *Anesthesiology Review.* 1989: pp. 29-33.
4. Lovich MA, Simon BA, Venegas JG, Sims NM, Cooper JB. A mass balance model for the Mapleson D anaesthesia breathing system. *Can J Anaesth.* 1993;40(6):554-67.
5. Kern H, Kuring A, Redlich U, Döpfner UR, Sims NM, Spies CD, Kox WJ. Downward movement of syringe pumps reduces syringe output. *Br J Anaesth.* 2001;86(6):828-31.

##### **Reviews/Chapters/Editorials**

1. Sims N, O'Young J, Philbin DM. Cardiac Anesthesia. In: In: Roberts AJ, Conti CR, editors. Current Surgery of the Heart. Philadelphia: JB Lippincott;1987. p. 296-304.
2. Sims NM. Upper Extremity Anesthesia. In: In: May JW Jr, Littler JW, editors. Converse Textbook of Plastic Surgery, The Hand and Upper Extremity. Philadelphia: WB Saunders;1990. p. 4302-4328.

#### **Books, Monographs, and Textbooks**

1. Ford-Carleton P, Sims NM, Welch JW, Colquitt N, Gurgul D, Nemeskal R. Assessment of effectiveness of a flexible monitoring system for non-ICU transitional patients. In: Beaverton, OR: WelchAllyn Monitoring; 1994 Jan. Report No.: [www.monitoring.welchallyn.com/pdfs/](http://www.monitoring.welchallyn.com/pdfs/). Technical report sponsored jointly by Massachusetts General Hospital and Protocol Systems, Beaverton, OR.

#### **Educational Materials**

1. Sims, NM. User Operation; Baxter AS20G Syringe Infusion Pump [videocassette]. 1989.
2. Sims NM et al. Development of the Flexible Monitoring System [videocassette]. 1993.
3. Sims NM, Kinnealey ME, et al. Physiological Monitoring Systems Web-Based Training [online interactive learning application]. 2001.
4. Guttag, J, Sims NM, Mezrich R. Patient Centric Network [videocassette]. 2002.
5. Sims NM. Guidelines for the use of standardized intravenous medications in pediatric anesthesia and critical care [monograph, laminated pages in binder] (final title TBD). 2005.

#### **Thesis**

1. Sims, NM. The pill for diabetics: Roles of the pharmaceutical industry, the FDA, physicians, and a clinical trial in evaluating the efficacy of a widely-used therapy. Cambridge, MA: Harvard College, Harvard University;1975.

#### **Patents**

1. Sims NM, Welch, JP, inventors; General Hospital Corporation, assignee. Transport system for portable patient care apparatus. US patent 4,945,592. 1990 Aug 7.
2. Welch JP, Sims NM, inventors; General Hospital Corporation, assignee. Network for portable patient monitoring devices. US patent 5,319,363. 1994 Jul 7.
3. Sims NM, Turner JM, Zeisloft JM, Kusswurm DC, LaBedz RH, inventors; General Hospital Corp. and Baxter International, assignees. Managing an inventory of devices. US patent 5,434,775. 1995 Jul 18.
4. Ford AD, Sims NM, Mandro MA, inventors; General Hospital Corp and Baxter

- International, assignees. Infusion pump with an electronically loadable drug library and a user interface for loading the library. US 5,681,285. 1997 Oct 28.
5. Sims NM, Kadner SP, Ferguson K, Martínez C, Rajala R, inventors; General Hospital Corp. and Aquila Technologies Group. Connecting a portable device to a network. US patent 5,689,242. 1997 Nov 18.
  6. Sims NM, Wollowitz M, Wrightson D, inventors; General Hospital Corporation, assignee. Multi-dose syringe driver. US patent 5,722,956. 1998 Mar 3.
  7. Sims NM, Wollowitz M, Wrightson D, inventors; General Hospital Corporation, assignee. Multi-dose syringe driver. US patent 5,954,695. 1999 Sep 21.
  8. Sims NM, Wollowitz M, inventors; General Hospital Corporation, assignee. Medical equipment transport system. US 5,987,670. 1999 Nov 23.
  9. Sims NM, Wright JD, Ribeiro R, George, A, Wollowitz MH, Sproul RJ, inventors; General Hospital Corporation, assignee. Transfer System for Portable Patient Care Apparatus. WO 0009061A1. 2000 Feb 24.
  10. Ford AD, Sims NM, Mandro MA, inventors; General Hospital Corp. and Baxter International. Infusion pump with an electronically loadable drug library and a user interface for loading the library. US patent 6,269,340. 2001 Jul 31.
  11. Ford AD, Sims NM, Mandro MA, inventors; General Hospital Corp. and Baxter International, assignees. Infusion pump with an electronically loadable drug library and a user interface for using the library. US 2002007785A1. 2002 Jun 20.
  12. Sims NM, Colquitt N, Dempsey M, Wollowitz M, Hickox M, inventors; General Hospital Corporation, assignee. Life Sign Detection and Health State Assessment System. US (provisional) 60/517,149. 2003 Nov 4.
  13. Sims NM, Colquitt N, Dempsey M, Wollowitz M, Hickox M, inventors; General Hospital Corporation, assignee. Respiration motion detection and health state assessment system. US (application) based on 60/517,14. 2004 Nov 4.
  14. Sims NM, Colquitt N, Dempsey M, Wollowitz M, Hickox M, inventors; General Hospital Corporation, assignee. Life Sign Detection and Health State Assessment System. US (application) based on 60/517,14. 2004 Nov 4.

## Abstracts

1. Sims NM, Welch, JP. Temperature gradients within anesthesia breathing circuits when heated humidification is used. *Anesthesiology*. 1984;61:A150.
2. Sims NM, Geoffrion CA, Welch JP, Jung W, Burke JF. Respiratory tract burns caused by heated humidification of anesthetic gases in intubated, mechanically ventilated dogs - a light microscopic study. *Anesthesiology*. 1986;65:A490.
3. Sims NM, Gargano DA, Martin PJ, Welch JP, Geoffrion CA, Newbower RS. Effect of excessive heated humidification of anesthetic gases on airway and blood temperatures in the intubated, mechanically ventilated dog. *Anesthesiology*. 1986;65:A127.
4. Sandberg WS, Stahl JE, Goldman JM, Wiklund RA, Sims NM. Redesigning Anesthesia Care for an Operating Room of the Future: Implementation and

Preliminary Results. American Society of Anesthesiologists, Poster, 2003 Annual Meeting. 2003;xx(xx):01-01.

5. Goldman JM; Sandberg W.; Stahl J.; Sims NM; Wiklund RA; Berger D. ; Rattner D.. Redesigning Perioperative Processes to Maximize O.R. Throughput in a Tertiary Care Medical Center. 13th World Congress of Anesthesiology. 2004;xx(xx):01-01.